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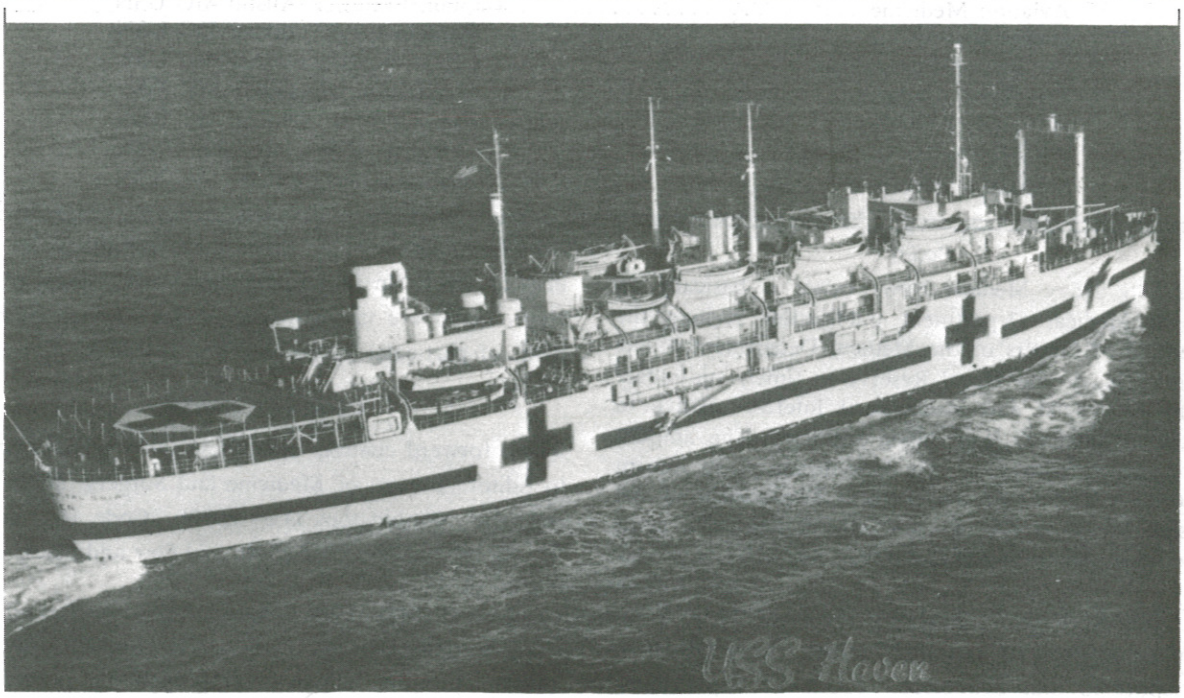

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MEDICAL NEWS LETTER

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Policy

The U.S. Navy Medical News Letter is basically an official Medical Department publication inviting the attention of officers of the Medical Department of the Regular Navy and Naval Reserve to timely up-to-date items of official and professional interest relative to medicine, dentistry, and allied sciences. The amount of information used is only that necessary to inform adequately officers of the Medical Department of the existence and source of such information. The items used are neither intended to be, nor are they, susceptible to use by any officer as a substitute for any item or article, in its original form. All readers of the News Letter are urged to obtain the original of those items of particular interest to the individual.

Change of Address

Please forward changes of address for the News Letter to Editor: Bureau of Medicine and Surgery, Navy Department, Washington, D.C. 20390 (Code 18), giving full name, rank, corps, and old and new addresses.

FRONT COVER: USS HAVEN (AH 12). Commissioned on 5 May 1945, the HAVEN embarked her first contingent of patients, mostly neuropsychiatric and tuberculous cases, at Pearl Harbor 23 July for transport to San Francisco. From 11 September for several months she was employed in processing about 10,000 Allied ex-prisoners of war from Kyushu, Japan, transporting them and other patients to Okinawa, Guam, Saipan and San Francisco. In the summer of 1946, with necessary radiological personnel and laboratory equipment aboard, she was assigned to the support of the atomic bomb test project at Bikini, later sailing to Kwajalein to continue as laboratory and berthing ship for the radiological personnel while the target vessels were being inspected. Following decontamination and decommissioning on 13 May 1947, she was recommissioned on 15 September 1950, and arrived at Inchon, Korea 18 October 1950. She served as station hospital at Inchon and Pusan, as well as at Yokohama and Sasebo, treating over 15,000 inpatients and many more outpatients during a 2-year period, including a high census of 770 inpatients on 19 November 1950. In the first period of her Korean duty, of the patients admitted, only ½ of 1 percent died, and later only 1 percent. In 1953 alone, the HAVEN received 576 patients landed by helicopter on the ship's new flight deck, many having been wounded only 30 minutes before reaching the hospital for treatment. In 1954 she evacuated 747 French patients from Indochina to Oran, Algiers and to France, completing a circumnavigation of the globe that year. Since 1956 the HAVEN has been inservice-in-reserve as a station hospital, serving military patient populations in the Long Beach area.

This outstanding hospital ship has an overall length of 520 feet, beam of 72 feet, a speed of 18 knots, displacement of 11,400 tons; and in 1953 had a complement of 82 officers and 538 enlisted line and hospital personnel.

The issuance of this publication approved by the Secretary of the Navy on 4 May 1964.

SPECIAL ARTICLE

GUIDELINES FOR THE MANAGEMENT OF MALARIA

Over 90% of the identifiable malaria encountered in Southeast Asia is due to *Plasmodium falciparum* and only a very small portion to *P. vivax*. This suggests rather strongly that the current chemoprophylactic combined tablet (chloroquine base, 300 mgs; primaquine base, 45 mgs) is effective in suppressing *vivax* infections and probably a certain number of *falciparum* infections as well. Furthermore, the fact that the incidence rate of malaria among troops on active combat or patrol duty is several times higher than among support troops based in the same area indicates that environmental control measures are still effective to the extent that the tactical situation permits their application.

Falciparum malaria frequently does not appear in the classical form with recurrent attacks of chills, fever, and sweating. Cases have presented with gastrointestinal complaints, musculoskeletal symptoms, postural hypotension, unexplained high fever, irrational behavior, and delirium, the latter not infrequently without fever or even with subnormal temperature. *Malaria should be considered in the differential diagnosis of any sick individual who has been in Southeast Asia.* Early diagnosis and initiation of therapy are of utmost importance. Because routine thin blood smears are less apt to show the parasites in *falciparum* malaria than in other forms of malaria, the use of thick smears is advised whenever the diagnosis of malaria is under consideration. Each smear should be examined for at least 10 minutes before being reported as negative. Detailed information on methodology can be found in reference (1), "Medical Protozoology and Helminthology."

In the therapy of *P. falciparum* malaria, the standard chloroquine regimen as prescribed in NAVMED P–5052–10, "Malaria," and in the booklet "Control of Communicable Diseases in Man," 10th Edition, 1965, will prove effective in about 50% of cases. This consists of an initial dose of chloroquine phosphate, 1.0 Gram (2 tablets, each containing 300 mgm of base), 0.5 Gram 6 hours later, and then 0.5 Gram once daily for the next 2 successive days. (Total dose is 5 tablets or 2.5 Grams of chloroquine phosphate in 3 days). If the patient is unable to take or retain chloroquine given orally, the drug may be given as the hydrochloride, 250 mgs intramuscularly, and repeated in 6 hours, switching as soon as possible to the oral medication. This regimen should be employed initially for patients with any type of malaria who are not critically ill and in whom the record does not indicate that such a course of therapy has already been administered.

In patients (a) who are gravely ill, or (b) have not responded to the chloroquine treatment described above, or (c) have a clinical relapse despite a previous response to a course of chloroquine, the treatment of choice is quinine. This is administered as quinine sulfate 1.0 Gram (3 tablets of 5 grains each) 3 times daily for 2 days, followed by 0.65 Gram (2 tablets of 5 grains each) 3 times daily for the next 10 days. Because of a variable tendency to develop postural hypotension, patients should be kept at bed rest during quinine administration. The urine output should be measured and if oliguria develops, quinine should be temporarily discontinued. During oliguria, quinine blood levels rise precipitously and acute quinine toxicity ensues. Of major clinical importance is the phenomenon of fluid retention in malaria. Although the exact pathophysiology has not been elucidated, it has been observed that patients with *P. falciparum* malaria occasionally become hypervolemic due to the retention of water and electrolytes and possibly loss of albumin. For these reasons it is imperative that *parenteral fluids be used extremely sparingly*. Overhydration can lead to cerebral edema which is easily confused with cerebral malaria. In rare instances pulmonary edema may result if there is underlying heart disease.

When the patient is unable to retain quinine because of vomiting, or when coma, presumed due to *falciparum* malaria, is present, the drug must be

given intravenously. It must be emphasized that this treatment carries a serious hazard and should be resorted to only when the patient's condition clearly warrants the risk and no other form of treatment is possible. Quinine is administered intravenously as the dihydrochloride, 600 mgs in 200 cc of normal saline, by *very slow* intravenous drip over a period of at least 30 minutes with constant monitoring of the blood pressure and of the pulse to detect hypotension or arrhythmia. The same intravenous dose may be repeated at intervals of 6 to 8 hours if the patient's condition requires. Oral therapy, by stomach tube if necessary, should be utilized as soon as possible.

Patients who relapse after quinine therapy should be retreated with quinine as described above. If necessary, the course of quinine may be maintained for 21 days at a dosage of 0.65 Grams (10 grains) 3 times daily, as tolerated.

In patients who do not respond clinically or in whom parasitemia persists or recurs after the second course of quinine therapy, it has been found that combinations of sulfadiazine plus a sulfone (diaminodiphenylsulfone or DDS, the antileprosy drug) produce a cure. Dose schedules:

a. 4 Grams sulfadiazine daily for 6 days together with 100 mgs DDS daily for 6 days, *or*

b. 50 mg of pyrimethamine (Daraprim) daily for 3 days plus 100 mg of DDS daily for 6 days.

A very small number of patients will relapse clinically or experience parasitemia following this DDS therapy. In such cases, it is recommended that the medical officer contact CAPT Jack W. Millar MC USN, Director, Preventive Medicine Division, Bureau of Medicine and Surgery, Washington, D.C., (telephone collect Area Code 202, OXford 6–2886 or OXford 6–3816); evenings and weekends call OXford 6–2063 or OXford 6–5382, for a supply of an experimental drug RO4-4393 (Fanasil). The dosage is 1 Gram of RO4-4393 and 50 milligrams of Daraprim; repeated 1 week later, if necessary. This 1-dose treatment has proven to be curative. Shipment will be expedited by air mail, special delivery. Complete instructions will be included.

Patients treated for malaria by any of the above regimens should be followed for four weeks subsequent to treatment in the medical facility and thick blood smears should be examined at least weekly. In addition, the patient should take the combined chloroquine-primaquine prophylactic tablet at weekly intervals for a total of eight weeks as further insurance against the development of *P. vivax* malaria. *NOTE.* The combined chloroquine-primaquine tablet should *never* be used for therapy of the acute attack, as the amount of primaquine contained therein (45 mgs) may produce hemolytic reactions when the tablet is administered in this manner. This drug is used *only* to destroy the exo-erythrocytic, or tissue, forms of *vivax* malaria parasite in individuals who have been in a malarious area.

An infrequent, but serious, complication of *falciparum* malaria is the occurrence of black-water fever. This is an acute intravascular hemolytic episode with such rapid red blood cell destruction that the reticuloendothelial system is unable to dispose of the pigments. Hemoglobinuria, the cardinal diagnostic sign, results. Opinions differ as to the precise cause of this complication. It is known to occur more frequently in the individual with chronic (or recurrent) malaria due to *P. falciparum.* It appears to occur more frequently in the Negro and, according to some, is related to therapy with quinine. It also has occurred in patients receiving primaquine during the acute phase of *falciparum* malaria. Treatment of black-water fever is essentially the treatment for an acute hemolytic transfusion reaction: Mannitol and hydration to institute and maintain diuresis, alkalinization to minimize the formation of hemoglobin casts in the kidney and the use of peritoneal or hemodialysis if renal failure occurs. An intravenous infusion should be administered and twenty grams of mannitol (100 ml of a 20% solution) given over 5–10 minutes after the patient has been sufficiently hydrated. If urine flow in the next two hours is under 60 ml per hour, fluids should be restricted and the patient treated as for acute renal failure. If urine flow exceeds 60 ml per hour, then hydration should be continued and 100 ml of 20% mannitol administered often enough to maintain a urine flow of 100 ml per hour or more. The patient must be carefully monitored during prolonged mannitol therapy for sodium loss with resultant hyponatremia. Packed RBC should be given if necessary to combat severe anemia. Despite the fact that some authorities have suggested quinine as a possible cause of black-water fever, quinine should be given as described above if black-water fever occurs in the presence of demonstrable parasitemia. Caution should be exercised in determining quinine dosage if the blood urea nitrogen is elevated, since a delay in the degradation of quinine under such circumstances may result in dangerously high blood levels of the drug. Individuals who have had a documented attack of cerebral malaria or black-water fever associated with malaria will not be returned to duty in any endemic malarious area. This

assignment restriction applies also to individuals who, having recognized glucose–6–phosphate dehydrogenase deficiency, are particularly prone to hemolytic reactions.

It is recognized that there are many drugs other than those mentioned above which have been utilized for the treatment of malaria. These include a variety of drugs directed against various stages of the parasite life cycle. In addition, corticosteroids have been reported to be of benefit to patients with cerebral malaria and may be used in severely ill patients manifesting evidence of adrenal cortical insufficiency or unresponsive black-water fever. Field studies are currently being conducted on various aspects of this problem. One of these includes the addition of 25 mg per day of DDS (diaminodiphenylsulfone) to the standard chloroquine-primaquine prophylactic regimen. If this proves to be effective in preventing clinical malaria and is recommended as part of the routine preventive program, it must be remembered that DDS acts only as a suppressant. Therefore, when a man leaves Southeast Asia, he will have to be treated for both *P. falciparum* and *P. vivax* malaria.

The treatment of malaria is receiving constant study and it is entirely possible that other and preferred treatment regimens to those outlined may be recommended in the future. However, in the opinion of those best qualified to advise, the treatments as stated are the safest and most effective available at this time and will be adhered to until such time as the substitution of another treatment schedule is approved by The Surgeon General. Medical officers are encouraged to propose, for consideration by The Surgeon General, modification of these and other treatment regimens. —PrevMed Div, BuMed.

Pharmaceutical References

Federal Stock No.	Description	
6505–753–5043	Chloroquine Phosphate 0.500 gm, Primaquine Phosphate 0.079 gm	500s
6505–299–8014	Chloroquine Hydrochloride Injection (Each ampul contains the equivalent of 0.2 gm of chloroquine base)	5cc, 10s
6505–113–9295	Chloroquine Phosphate Tablets, USP 0.5 gm (7½ gr)	100s
6505–113–9310	Chloroquine Phosphate Tablets, USP 0.5 gm (7½ gr)	1000s
6505–074–4582	Quinine Dihydrochloride Injection, NF 0.3 gm (5 gr) per cc, 2cc	12s
6505–782–2662	Quinine Sulfate Tablets, NF 0.324 gm (5 gr)	1000s
6505–146–2192	Sulfadiazine Tablets, 0.5 gm (7½ gr)	100s
6505–146–2200	Sulfadiazine Tablets, 0.5 gm (7½ gr)	1000s
Non-standard	Daraprim brand pyrimethamine 0.025 gm (Burroughs Wellcome & Co., Tuckahoe, New York) 30's	1000s
Non-standard	Mannitol—20% solution in water (Osmitrol—Travenol Laboratories, Inc., Morton Grove, Illinois) 250 ml and 500 ml	
Non-standard	Avlosulfon, brand of diaminodiphenylsulfone (DDS) (Ayerst Laboratories, 685 Third Avenue, New York, New York)	

References

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2. NAVMED P–5052–10, "Malaria," June 1959 (currently under revision).
3. "Control of Communicable Diseases in Man," 10th Edition, American Public Health Association, 1965.
4. Internal Medicine in World War II, Vol. II, Infectious Diseases, 1963 OTSG, Dept of Army.
5. Preventive Medicine in World War II, Vol VI, Communicable Diseases, 1963 OTSG, Dept of Army.
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7. Cirkena, et al: Use of Mannitol, etc., N Eng J Med 270: 161–166, Jan 23, 1964.
8. WHO Bulletin 31(3): 379–392, 1964, "Studies on a Strain of Chloroquine-Resistant *Plasmodium falciparum* from Viet Nam" by R. D. Powell, et al.

THE CLINICAL CONCEPT OF PRIMARY MYOCARDIAL DISEASE

A CLASSIFICATION AND A FEW NOTES ON MANAGEMENT AND PROGNOSIS

By Thomas W. Mattingly MD, Department of Medicine and Cardiology, Washington Hospital Center, Washington, D.C. *Circulation XXXII (5): 845–851, November 1965. Reprinted with permission of the American Heart Assn., Inc.*

A useful and effective guide for therapy of any disease requires a common understanding of the disease by the author and the reader. It is essential that the disease entity be identified before therapy is discussed, prescribed or evaluated. In many disease entities, this mutual understanding is well established by familiarity with the disease as gained by similar periods of training and experience or from information that is readily available in standard reference texts. Neither the familiarity, mutual experience, or immediate reference sources presently exist in relation to the disease under discussion. Current medical conferences conducted by participants familiar with myocardial disease are characterized by a great disparity in the concepts of the diseases of the myocardium. For these reasons, it is considered that a brief description of the author's concepts of primary myocardial disease be provided prior to a discussion of therapy.

Definition and Classification

The term primary myocardial disease as used here and in prior publications refers to groups of diseases that primarily involve the myocardium and spare or only minimally involve other important structures of the heart and the cardiovascular system. By definition, it excludes secondary forms of myocardial disease complicating occlusive coronary artery disease and systemic and pulmonary hypertensive cardiovascular diseases as the disease processes in these conditions primarily involve the coronary, systemic, or pulmonary vasculature with secondary myocardial hypertrophy, degeneration, and fibrosis. Likewise, syphilis with its primary cardiovascular lesions in the aorta and aortic valve and rheumatic heart disease with its proclivity to produce valvular lesions are not ordinarily considered as primary myocardial diseases but admittedly instances occur where rheumatic lesions are primarily and only in the myocardium. Most congenital malformations produce secondary myocardial alterations of hypertrophy, dilatation, or degeneration but there are some in which the defects involve primarily the myocardium, e.g., glycogen-storage disease. When the important cardiovascular component or complication of a systemic disease is limited to the myocardium or constitutes the major clinical component, the myocardial disease resulting therefrom is included in this category.

This concept of primary myocardial disease therefore includes acute and chronic forms of myocarditis of specific as well as nonspecific etiology and their myocardial sequelae, congenital structural and functional malformations of the myocardium, myocardial neoplasms, infiltrative cardiopathies such as occur in amyloidosis and hemochromatosis, the cardiomyopathies occurring with endocrine, metabolic, neuromuscular, and musculoskeletal diseases as well as the chronic idiopathic myocardial and endomyocardial diseases, which are probably sequelae of myocardial damage and dysfunction resulting from one of the preceding conditions which were unrecognized at an earlier stage. A useful classification is given as follows:

1. Myocarditis, Specific, Acute and Chronic

Includes the reactions to injury, repair and immunologic responses to bacterial, viral, mycotic, protozoal, and rickettsial infections and parasitic infestations; specific bacterial toxins and toxic chemicals and drugs; physical trauma, including electrical current and radiation.

2. Myocarditis, Nonspecific, Acute and Chronic

Includes reactions to injury, repair and immunologic responses to unknown agents. Variously reported as Fiedler's, giant-cell, idiopathic, and granu-

lomatous myocarditis. So-called autoimmune or autoallergic and hypersensitivity myocarditis are included. Also myocarditis of rheumatic fever, rheumatoid diseases, lupus erythematosus, progressive systemic sclerosis and other diseases with vasculitis and connective-tissue alteration of the myocardium are included in this group.

3. Metabolic and Nutritional Disorders of the Myocardium

Includes morphologic and functional alterations resulting from hyperthyroidism, hypothyroidism, pheochromocytomas, adrenal insufficiency, primary hyperaldosteronism, hyperinsulinism, and acromegaly; thiamin deficiency, dysproteinemias, severe chronic anemias, hypokalemia, and hyperkalemia.

4. Idiopathic Myocardiopathies

Includes cardiac hypertrophy and dilatation of obscure nature with and without myocardial or endomyocardial fibrosis. Probably residuals of repair and hemodynamic adaptation to groups 1, 2, 3 above. Reported in literature under many names: idiopathic hypertrophy, cardiomegaly or cardiomyopathy, familial cardiomyopathy, alcoholic cardiomyopathy, interstitial myocardial fibrosis, myocarditis with endomyocardial fibrosis or elastosis, congenital and adult forms of endocardial or subendocardial fibrosis, sclerosis or fibroelastosis and cardiovascular collagenosis with recurrent parietal thromboendocarditis.

5. Primary Idiopathic Myocardial Obstructive Hypertrophy

Includes hypertrophic myocardial lesions of the ventricle and septum which produce dynamic subvalvular obstruction. Reported in literature as asymmetrical hypertrophy, idiopathic hypertrophic subaortic stenosis, muscular subvalvular stenosis, familial muscular stenosis, idiopathic hypertrophy simulating aortic stenosis, idiopathic ventricular septal hypertrophy simulating valvular stenosis, obstructive cardiomyopathy simulating aortic stenosis, idiopathic subaortic stenosis, pseudoaortic stenosis produced by ventricular hypertrophy or simply as functional obstruction to the left ventricle. This lesion may represent localized reaction to previous injury (myocarditis).

6. Infiltrative Diseases of the Myocardium

Includes amyloidosis, fatty infiltration, glycogenosis (glycogen-storage disease), hemochromatosis, tumor invasion and metastasis, including lymphomas, leukemias, and xanthomatosis.

7. Myocardial Lesions Associated with Neuromuscular Disorders

Includes myocardial lesions associated with muscular dystrophies and Friedreich's ataxia; lesions associated with myositis, myasthenia gravis, and the myocarditis associated with thymoma.

8. Primary Myocardial Neoplasms

Includes rhabdomyomas, sarcomas and angiosarcomas, fibromas, lipomas and tumors of the specialized tissues of the conduction system of the myocardium.

The term "primary myocardial disease" is frequently used by others in a more restricted sense to include only the idiopathic forms of myocardial disease. Others prefer simply to refer to these idiopathic forms as myocardial diseases of unknown cause. Likewise the terms cardiomyopathy and myocardiopathy are currently used to describe this group of diseases; again by some as a general term and by others in a restricted sense and referring only to the idiopathic forms of myocardial disease.

Clinical Features of Primary Myocardial Disease

The clinical features of primary myocardial disease arise from faults in normal myocardial function. The appreciation of specific clinical features and hemodynamic alterations as manifestations of these faults of the myocardium as a functional unit of the cardiovascular system constitutes the basis for a positive clinical diagnosis. In spite of the great diversity of etiologic factors and a wide spectrum in its severity and clinical course as presented by primary forms of myocardial disease, it has been observed that they present clinical features that permit a positive diagnosis with an accuracy approaching that of the more common secondary forms of myocardial disease, valvular heart disease, or pericardial diseases. These clinical and hemodynamic features have been described in great detail elsewhere. Familiarity with these features is essential to the correct diagnosis, and appropriate management and a careful review are recommended.

General Principles in Management

The great diversity and multiplicity of causes and variations in severity as presented by primary myocardial disease make it difficult to outline a standard procedure for therapy. Individual evaluation and management are imperative. A plan of individual

evaluation and management of primary myocardial disease requires the following: (1) a sound basis for a definite or presumptive clinical diagnosis; (2) establishment of the specific cause as promptly as possible and, if not obvious, a continued search for the cause or identification of the disease mechanism involved but avoiding a change of therapy with every passing idea; (3) a careful initial bedside clinical and hemodynamic assessment of the status of myocardial function, both at rest and with activity; (4) a determination as to whether the disease is one isolated to the myocardium or to the myocardium and pericardium or whether there exists an important systemic disease of which the myocardial disease is only one element of several potential fatal or crippling features, e.g., treatment of congestive failure or heart block in diphtheritic myocarditis and ignoring the systemic infection and the effect of the toxin on other organs; (5) a determination of the nature of the myocardial alteration, that is, is it an acute inflammatory or destructive process or one suggesting a hypersensitivity process or, on the other hand, is it a chronic disease state with gradual impairment of myocardial function and repeated adaptive responses; (6) an assessment of the functional alterations to include arrhythmias, conduction disorders, anemias, dysproteinemias, electrolyte and enzyme abnormalities; and (7) the nature of the peripheral effects of the malfunctioning myocardium (central pump), e.g., congestion or ischemia of the peripheral tissues and organs, the presence of a reactive systemic or pulmonary hypertension or systemic or pulmonary thromboembolism.

A failure to make the above evaluation and the institution of empirical therapy for the most overt finding or symptom based only on a superficial evaluation can be disastrous or it can greatly deter the progress of recovery and rehabilitation. Such practices have resulted in erroneous concepts of therapy and prognosis. A good example is the vigorous use of digitalis in the treatment of existing congestive failure without an assessment of the status of the serum electrolytes or of an existing arrhythmia or conduction disorder. Repeated experiences and practice of this nature have resulted in therapeutic recommendations and opinions that digitalis should not be used in the treatment of primary myocardial disease or that there is an unusual degree of digitalis sensitivity or myocardial irritability present which precludes its effective use. Another frequent failure in the initial evaluation is a failure to establish the cause of an enlarged cardiac silhouette. Acute cardiac dilatation is confused with pericardial effusion or at other times with chronic hypertrophy. A third error is the reverse, namely, to deny the diagnosis of primary myocardial disease because cardiomegaly and congestive failure are not initially present and the patient is later observed to succumb to a functional disorder, such as a disorder of conduction, an arrhythmia or an electrolyte disorder such as hyperkalemia.

An adequate assessment can usually be made at the bedside, utilizing the history and an evaluation of the clinical findings in light of the knowledge of the clinical course and manifestations of primary myocardial disease. The state of the cardiac output as well as the degree of cardiac dilatation and hypertrophy or the extent of the reactive pulmonary hypertension can be evaluated by the presence or absence of bedside findings. Special roentgenologic and hemodynamic studies should be selected to obtain specific information rather than made routine prior to careful bedside evaluation. Serologic, immunologic, and biochemical studies of the blood and histologic and histochemical studies of biopsy material are useful and practical only when appropriately applied after a good initial evaluation or when prior observations indicated diagnostic potentialities.

A procedure of therapeutic management based on individual evaluation permits a general plan and method of therapy that can be applied and adapted to patients with a wide spectrum of presenting symptoms and clinical states. A guide for management is suggested but flexibility is stressed.

General Plan of Management

1. Immediate therapy of the presenting features which are life threatening.
2. Determination of the degree of activity to be prescribed during the continuation of supportive therapy and diagnostic studies.
3. Diagnostic studies and institution of specific therapy as indicated.
4. Long-term management directed toward maximum rehabilitation consistent with the residual status of myocardial function.
5. Periodic evaluation and prevention of complications.

The presenting features which have been observed to be a threat to life are (1) myocardial insufficiency (congestive failure and circulatory failure), (2) arrhythmias or conduction disorders, or both, and (3) thromboembolic complications, chiefly in the subacute and chronic forms of primary myocardial disease. In general, conventional measures are indicated for the management of these clinical problems.

Hospitalization, preferably in an intensive care unit with complete bed rest and inactivity are important.

The response to adequate therapy is usually good in the initial phase of primary myocardial disease provided it is not associated with a systemic disease, which in itself is a threat to life, and provided associated arrhythmias and conduction disorders and failures are successfully managed over a sufficient period to permit the patient to recover from the cardiac dilatation or develop adaptive hypertrophy which develops early if the patient is to survive. Complications resulting directly from therapy itself, e.g., digitalis intoxication, electrolyte problems, and thromboembolism account for the majority of failures. Therapy is less likely to be successful when the features of left-sided failure are predominant with or without congestion but with an extremely low cardiac output, systemic hypotension, and poor coronary, renal, and cerebral blood flow. The technics of mechanical cardiac assists, now in the experimental stage, may eventually prove helpful. Corticosteroids have not been found helpful in the treatment of failure per se except when the steroid has an effect on a specific type of tissue alteration, infection, or metabolic abnormality.

Refractory congestive failure is a feature of the subactue and chronic forms of primary myocardial disease, especially the idiopathic form. Complications of pulmonary embolism and electrolyte disorders of hypochloremic alkalosis, hyponatremia and hemodilution are more likely to occur at this stage, even with the best management. Conventional methods of management of these complications are used. Newer drugs such as spironolactone have seldom demonstrated a specific advantage over careful use of digitalis and mercurial diuretics but occasionally their short-term addition is helpful.

The extent and duration of restriction prescribed for the patient during the period of therapy and necessary diagnostic studies or, more optimistically, the degree of activity permitted depends upon many factors. It is considered unwise to resort to a standard practice of prescribing complete bed rest for an arbitrary period for each patient with a diagnosis of primary myocardial disease. Individual evaluation and prescription is important, as in other features of management. The spectrum of activity that can be safely permitted is as wide as the clinical manifestations of the disease.

Restriction to bed status is made under the following conditions: (1) during the first episode of failure when there is an enlarged cardiac silhouette and clinical features of acute cardiac dilatation. Complete bed rest is more important and beneficial in this phase of the disease and, if appropriately applied with restoration of good myocardial function and rehabilitation, is often excellent. The duration of the prescribed bed rest is usually a matter of months and is determined by repeated clinical evaluation and not by a predetermined time table; (2) when cardiomegaly and failure are present on initial evaluation but the onset of failure as well as the relative degree of dilatation and hypertrophy is not known. While overtly the situation may be the result of a subacute or chronic process with some degree of functional adaptation, the presence of failure always suggests that an additional element of dilatation has occurred, and a period of decreased activity may permit a return to the chronic state pre-existing the current failure. Serial roentgenograms and clinical evaluations are the best guides to the duration of restriction in such cases. Experience has not demonstrated any benefits of prolonged bed rest in this type of patient over that normally practiced by allowing activity consistent with demonstrated tolerance; (3) during the treatment of episodes of acute arrhythmias, unstable block, and episodes of thromboembolism.

Although the clinical diagnosis of primary myocardial disease is usually readily made from the distinctive clinical features arising from existing faults in myocardial function, a specific cause is often not obvious on initial evaluation and treatment and some remain in the idiopathic group even after autopsy study. A continued search is however maintained for a specific cause, thereby hoping to remove the patient from the idiopathic group into one of the other classifications, as previously listed, wherein specific therapy is available or where the disease mechanism is better understood and managed. This is a diagnostic challenge that the attending physician should accept rather than to accept the label of idiopathic disease or alcoholic myocardiopathy with only supportive, symptomatic, and empiric therapy.

Today the physician is provided with an increasing battery of diagnostic laboratory procedures including serologic, biochemical, immunologic, and immunochemical procedures applicable to the blood and sera and biopsy technics applicable to numerous body tissues, including the myocardium, which offer aid in specific diagnosis.

Surgery has provided beneficial results in a few forms of primary myocardial disease, such as the removal of localized tumors of the myocardium and surgical resections of hypertrophic muscle tissue in the hypertrophic muscular lesions involving the out-

flow tract of the left ventricle. Surgical treatment in the form of the production of poudrage has been applied to infants with endomyocardial fibroelastosis but the results have been difficult to evaluate.

An exploratory mediastinotomy has been found helpful in the study of patients with clinical features of myocardial or combined pericardial and myocardial disease of unknown etiology. Such surgical procedures permit direct visual, palpable, and biopsy examinations of the pericardium, myocardium, and coronary vessels. On other occasions, an exploratory mediastinotomy has been necessary to solve the problem of differential diagnosis between constrictive pericarditis and primary myocardial disease and at the same time provide definitive surgical therapy for the constrictive pericarditis when present. Death from a surgically curable constrictive pericarditis has been observed to occur when such exploratory procedures were delayed or not considered in therapy.

Long-term management and therapy are necessary for the majority of patients with primary myocardial disease. There is a smaller group in whom recovery is complete or in whom the residual damage to the myocardium is such that normal activity is tolerated and in whom no therapy is required. However, the presence of minimal residual damage may become important should this individual develop obstructive ischemic coronary artery disease or have severe stress on the myocardium associated with some other form of systemic or cardiovascular disease such as systemic or pulmonary hypertensive cardiovascular disease, chronic renal disease, etc.

The nature of the long-term therapy will vary, depending upon the severity of the residual structural and functional alterations of the myocardium. Again, the most important problems are concerned with the management of myocardial insufficiency as may be manifested by (1) congestive or low-output failure; (2) arrhythmias and conduction disorders; (3) thromboembolic problems, and (4) specific therapy for the management of a systemic disease related to the primary myocardial disease.

The level of physical activity or nature of occupation permitted should be one which is tolerated without symptoms or with minimal symptoms. Graduated activity is important in the convalescent period and for successful rehabilitation. Childbearing is poorly tolerated by patients with symptomatic primary myocardial disease. The majority of so-called "postpartum heart disease" consist of instances of idiopathic primary myocardial disease, and subsequent pregnancies are frequently disastrous.

A program of combined maintenance, digitalization and judicious use of diuretics combined with restriction of sodium intake and physical activity provide the best form of therapy for those with continued features of congestion or with recurring episodes of congestive failure. Periodic therapy with vigorous diuresis should be avoided as complications of hemoconcentration, dehydration, and electrolyte imbalances result in serious and often fatal complications. Fatigue, exertional dizziness, and syncope occurring from low-out-put failure are best managed by limitation of activity and avoidance of sudden bouts of exertion.

Troublesome arrhythmias are managed by conventional therapy. Special attention should be given to unstable rhythms associated with atrioventricular block, as such may suddenly occur in chronic primary myocardial disease. Hospitalization and therapy are indicated as previously described. The implantation of a pacemaker deserves serious consideration in long-term management of those with complete heart block.

Anticoagulant therapy is an important part of long-term management, especially in those with persistent cardiac dilatation, low-out-put failure, or previous embolic episodes.

When primary myocardial disease occurs as a manifestation of systemic disease and when the disease itself cannot be cured, maintenance or supportive therapy becomes important. Steroid therapy for management of sarcoid, trichinosis, hypersensitivity states and collagen diseases may be beneficial. Thyroid medication becomes an important part of the management of the myocardial faults in severe hypothyroidism. Appropriate treatment of dysproteinemias, anemias, and chronic electrolyte abnormalities is important in the management of forms of primary myocardial disease associated with chronic nutritional and metabolic disorders. The causal relationship of alcohol intake and poor nutritional intake to the so-called alcoholic cardiomyopathy is yet to be clearly established. However, the highly suggestive relationship of excessive alcohol intake to some of the chronic forms of the disease is sufficient to warrant abstinence from alcohol and for the establishment of a well-balanced diet in these instances in which the two conditions coexist.

Lastly, the prevention of infections, especially of the respiratory and urinary tracts, is most important in these patients, as they constitute circulatory stresses that often precipitate or seriously aggravate existing congestive failure or arrhythmias in a patient otherwise doing well.

Prognosis and Prevention

The prognosis of primary myocardial disease has steadily improved in recent years as more has been learned as to cause, pathogenesis, and the nature of hemodynamic abnormalities. Earlier clinical recognition has altered the prognosis, e.g., many of the entities such as endomyocardial disease in infants and Fiedler's type of myocarditis in past years were considered universally fatal simply because these entities were only recognized at autopsy and survivors were not recognized. The clinical recognition of infantile endomyocardial disease has resulted in the experience of observing survival into childhood and adulthood. Myocarditis is simply an incidental feature in the total systemic disease of many infections and the over-all prognosis of myocarditis of all types is good. Myocarditis of infancy due to the Coxsackie virus, once considered a universally fatal disease, has undergone a favorable change in prognosis with the clinical and immunologic recognition of mild and occult forms of the disease.

The prognosis of subacute and chronic forms of myocarditis and of the idiopathic forms of primary myocardial disease is the poorest. Again, this poor prognosis in the past has been related to a failure to recognize the myocardial disease until the clinical endpoint of hemodynamic failure was reached. Often the patient with myocardial disease had survived for years. The recent report of hemodynamic studies of 14 patients with idiopathic hypertrophy without evidence of myocardial failure is good evidence of the degree of adaptive mechanisms which develop and permit survival. The overall prognosis as well as the prognosis of the individual type of primary myocardial disease can only be determined after a better understanding of pathogenesis and early recognition of the disease. For this reason, a plea is made to consider primary myocardial disease in the broad definition as used herein. The recognition of the clinical features of the disease provide the basis for an early and accurate diagnosis and differentiation from other forms of cardiovascular diseases. Knowledge of the various types of primary myocardial disease as given in the classification provided here permits a prompt diagnosis and the application of appropriate therapy as well as an intelligent basis for the search of the cause and therapy for those initially classified as idiopathic or simply as myocardial diseases of unknown cause.

(References may be seen in the original article.)

RECURRENT AND METASTATIC CARCINOMA IN SURGICALLY TREATED CARCINOMA OF LUNG

AN AUTOPSY SURVEY

Harlan J. Spjut MD and Luis E. Mateo MD. Cancer 18(11): 1462–1466, November 1965*

Several autopsy reviews have been made of patients dying of bronchogenic carcinoma. Two of the studies include treated patients but do not give separate data for treated and untreated carcinoma. The data from these papers serve as a base line in the study of the natural history of carcinoma of lung and alterations in the natural history due to various forms of therapy. Many patients with bronchogenic carcinoma who have been treated surgically die at home; few come to autopsy examination.

Several questions might be raised: Do patients who have had a pneumonectomy or lobectomy for carcinoma of the lung have a high rate of recurrence or persistence of tumor within the thoracic cavity? Also, what is the cause of death in these patients? Studies of pleural washings made immediately after a lobectomy or pneumonectomy for lung cancer contained cancer cells in 59% of specimens. The significance of this finding was not readily apparent but its potentialities were. An autopsy survey may answer the question as to the significance of these cells.

Another question that is of some interest is: What is the risk of a second carcinoma in patients who have had a previous resection for carcinoma of the lung? To investigate these problems, the protocols and slides of a group of patients who had had a previous lobectomy or pneumonectomy for carcinoma of the lung and subsequently had died and had been autopsied were reviewed.

The autopsies for review were from the files of the Houston Veterans Administration Hospital and the

* From the Department of Pathology, Baylor University College of Medicine and the Veterans Administration Hospital, Houston, Tex.

Ben Taub General Hospital for the period from 1950 to 1964. Studied were 72 patients who had had a pneumonectomy or lobectomy and had been autopsied at least one month after the surgical procedure. Fifteen additional patients who had died immediately after or within one month of a pneumonectomy or lobectomy also were reviewed. As can be seen from Table 1, the majority of patients died before 2 years had elapsed from time of the operation. Four of the patients survived 4 years and 2 patients lived 8½ and 9½ years after operation.

As might be expected from the source of the material, 85 of the patients were male and 2 were female. The age distribution is similar to that expected in bronchogenic carcinoma (Table 2). The type of operative procedure for the total group included 56 pneumonectomies and 31 lobectomies.

The carcinomas were classified histologically as squamous cell carcinoma in 54 cases (62%), adenocarcinoma in 10 cases (11%), undifferentiated carcinoma in 13 cases (15%), mixed carcinoma in 8 cases (9%) alveolar cell carcinoma in one case and unclassified in one case. The latter case, listed as unclassified, had received preoperative irradiation and in the resection specimen malignant cells could be identified but not specifically classified.

A series of terminal untreated patients with carcinoma of the lung who had an autopsy examination served as a basis for comparison with our group of patients. Two other groups of patients with lung carcinoma who had an autopsy examination have been used for comparison with ours and Budinger's patients although treated and untreated cases are admixed (Table 3). In general the distribution and incidence of metastases in the treated and untreated and the mixed groups of patients are quite similar. There are fewer regional lymph nodes involved in the treated group: 52% (our patients) compared with 88% (Budinger) and 85% (Halpert et al.) (Tables 3, 4). Among our patients who died within one month of the surgical procedure only a third had mediastinal nodes involved by carcinoma. This may mean that in this short period of time there was little opportunity for any tumor within the nodes to become of a size visible to the prosector (Table 4).

Table 1. Interval between Operation and Autopsy

Time postoperative	No. of cases
0–1 mo.	15
1–3 mos.	14
3–6 mos.	11
6–9 mos.	11
9–12 mos.	11
1–2 yrs.	10
2–3 yrs.	7
3–4 yrs.	4
4–5 yrs.	2
5–10 yrs.	2

Table 2. Age in Decades

Years	No. of cases
30–40	6
41–50	10
51–60	31
61–70	35
70+	5

Recurrence of carcinoma in the hemithorax from which a lung or a lobe had been removed was observed commonly in our group of patients (Tables 4–6). Recurrence is defined as carcinoma within the hemithorax involving residual lung lobes, bronchial stump, chest wall or parietal pleura. Tumor in the mediastinum, opposite lung or pericardium was considered separately. Of our patients 42% were found to have recurrent tumor in the hemithorax. Figures

Table 3. Metastases from Lung Cancer

Site	Present series*	Warren and Gates†	% Metastasizing: Budinger‡	% Metastasizing: Halpert et al§
Regional nodes	52	42	88	85
Distant nodes	30	21	—	—
Adrenal	26	17	33	38
Bone	25	13	31	22
Brain	37	11	20	38
Pericardium	19	9	30	21
Heart	2	7	9	
Kidney	18	12	19	20
Liver	29	20	42	44
Opposite lung	34	19	23	28
Pancreas	10	8	8	15
Spleen	8	7	4	9

* 72 cases (treated).
† 368 cases (treated and untreated).
‡250 cases (untreated, terminal).
§ 363 cases (treated and untreated).

Table 4. Recurrent Carcinoma and Metastases

Site	< 1 mo. (15 cases)	> 1 mo. (72 cases)
Hemithorax	3(20%)	34(47%)
Mediastinal nodes	5(33%)	38(52%)
Distant nodes	1(6%)	22(30%)
Opposite lung	2(13%)	25(34%)
Brain	3(20%)	27(37%)
Liver	3	21(29%)
Adrenal	3	19(26%)
Bone	1(6%)	18(25%)
Pericardium	1	14(19%)
Kidney	2(13%)	13(18%)
Pancreas	0	7(10%)
Spleen	1(6%)	6(8%)
Esophagus	0	3(4%)
Intestine	0	3(4%)
Thyroid	0	1(2%)
Skin	1(6%)	1(2%)
Prostate	0	2(3%)
Peritoneum	0	2(3%)
Abdominal wall	0	1(2%)
Heart	0	1(2%)

for comparison are not readily available from other autopsy surveys. Warren and Gates report that 9 of 100 who had previous surgical treatment had local recurrence of carcinoma. This is far below the number of recurrences among our 87 patients.

Distribution of the metastases and recurrences in our cases studied in relation to survival time provide some interesting observations (Table 5). Recurrence in the hemithorax from which the carcinoma was removed is an important feature of bronchogenic carcinoma studied in this way. The incidence of persistence or recurrent tumor in the hemithorax remains uniformly high with the peak of 59% reached in those patients surviving from 6 to 12 months postoperatively. The 4 patients who died between 3 and 4 years after resection had recurrence of carcinoma in the hemithorax. The 4 who survived 4 or more years were free of chest recurrence but 2 had metastasis—one to spleen and one to the opposite lung. The latter lesion may well have been a second primary carcinoma.

The 2 patients surviving more than 5 years had neither recurrence in the chest nor metastasis; both died of cardiovascular disease and emphysema. The brain, adrenal and lymph nodes remain important sites of metastasis throughout the survival periods; few brain metastases are seen after 3 years (Table 5). Of the patients who survived more than one month 10(14%) had no autopsy evidence of metastasis. Eight of these patients had neither recurrence in the hemithorax nor metastasis. Four of the 15 patients living less than one month were free of metastasis at time of autopsy.

Because of the current interest in the removal of solitary metastasis in patients who have had primary carcinomas treated, the number of patients with solitary metastasis in this series was tabulated. Among the patients who survived more than one month were 12(17%) who had solitary metastasis at the time of autopsy. These included 4 to the brain, 2 in the kidney, 2 in the opposite lung, one each in the intestine, pericardium, spleen and bone; 9 were

Table 5. Recurrence and Metastases According to Survival Time

Site	1–6 mos. (25 cases)	6–12 mos. (22 cases)	1–3 yrs. (17 cases)	3–10 yrs. (8 cases)
Recurrence	9(36%)	13(59%)	9(53%)	4(50%)
Mediastinal nodes	12(48%)	15(68%)	9(52%)	3(37%)
Brain	10(40%)	8(36%)	5(29%)	1(12%)
Distant nodes	8(32%)	10(45%)	5(29%)	2(25%)
Adrenal	8	4(18%)	4(23%)	1(12%)
Liver	8	6(27%)	4(23%)	2(25%)
Opposite lung	8	5(22%)	5(29%)	3(37%)
Kidney	8	5(22%)	1(6%)	1(12%)
Pericardium	6(24%)	5(22%)	3(18%)	0
Bone	5(20%)	9(40%)	2(12%)	2(25%)
Spleen	3(12%)	0	2(12%)	1(12%)

Note: Percentage is calculated on the basis of number of cases in each time period.

squamous cell carcinomas. In the group of patients who died in less than one month 7(46%) had solitary metastasis: 2 in the brain, 2 in mediastinal lymph nodes, and one each in the liver, adrenal and bone. Four of these metastases were squamous cell carcinomas.

Grouping of metastases according to histological type was probably not meaningful because of the overwhelming number of squamous cell carcinomas in our group. However, 100% of the patients with adenocarcinoma and 90% of those with undifferentiated carcinoma had metastases at autopsy. Little difference between pneumonectomy and lobectomy was evident when numbers of cases with multiple metastases, solitary metastasis, and no metastasis were compared (Table 6). Local recurrence, however, was much more common in patients treated by lobectomy (Table 6).

We had anticipated that the bronchial stump recurrences would be a significant reason for the failure of surgical treatment of bronchogenic carcinoma but surprisingly few of the patients had evidence of persistence or recurrent carcinoma of the stump. Only 7 such examples were reported in the autopsy protocols and none of these patients had tumor at the line of resection in the surgical specimen. In most autopsies only gross descriptions were available to indicate the status of the stump.

The often observed incidence of second primary carcinomas with upper and lower respiratory tract neoplasms has been confirmed in our small group of patients. Budinger reported 4.4% of the autopsied patients with bronchogenic carcinoma had other coexisting malignant tumors. Six of our patients had what appeared to be second primary carcinomas. Three of these were esophageal, one laryngeal, one lower lip, and one in the opposite lung. This represents 7% of our patients. One of the esophageal lesions is questionable, being associated with mediastinal lymph node metastases. It is possible that the lesion interpreted as a primary carcinoma in the esophagus was actually an invasive carcinoma from the lymph node metastases. The carcinoma in the opposite lung is considered to be new primary carcinoma because of the duration between operation and autopsy. The patient survived 3 years and 5 months after lobectomy. In previous reports of second primary carcinomas in patients with cancer of the lung a duration of 3 years has been deemed a minimal interval to rule out the possibility of metastasis.

The cause of death in our 87 patients was not stated clearly in all autopsy protocols. What was considered by us to be a major factor in the death of the patient is tabulated for each patient in Table 7.

Discussion

There seems to be little doubt that surgical treatment alters the course of pulmonary carcinoma. The expected 5-year survival rate of lung cancer that is resected successfully is usually in the neighborhood of 25% 5-year survival. This figure contrasts rather sharply with the survival of the terminal patients in Budinger's paper. Of his 250 patients 80% died within 3 weeks of admission to the hospital and 20% of these died within one week. If the duration of the illness is calculated in relation to the onset of symptoms, then the average length of life was 10 months. Even though the course of the disease was changed, surgical intervention did not alter distribution of metastases greatly. As can be seen from Table 3, the sites of metastasis are remarkably similar to those in the patients who were untreated for their bronchogenic carcinoma.

The most startling finding in our survey was the high rate of recurrence of carcinoma in the hemithorax (Tables 4, 6). This observation may very well reflect the fact that in many instances carcinomas, that seemingly are resectable actually are not. Or, the surgeon may relax his criteria for resectability of bronchogenic carcinomas, increasing the chance of local persistence of disease. A third possibility exists: Incision of the tumor either for biopsy or by mistake results in tumor seeding of the pleural

Table 6. Metastases and Recurrence

	> one month			
Type of therapy	Multiple metastases	Solitary metastases	No metastases	Recurrence
Pneumonectomy*	31(68%)	9(20%)	8(17%)	16(37%)
Lobectomy	19(70%)	3(11%)	2(7%)	18(66%)

* 45 pneumonectomies, 27 lobectomies.

Table 7. Major Contributory Factor to Death

Finding	Lived <1 mo.	Lived >1 mo.
Recurrent and metastatic carcinoma†	3	50
Abscess	—	2*
Pulmonary emboli	2	—
Pneumonia	1	4
Cardiac arrest	4	—
Cerebrovascular accident	—	1
Empyema with broncho-pulmonary fistula	—	3
Empyema	—	3
Pulmonary congestion	1	—
Pulmonary edema	1	—
Peritonitis	—	2‡
Cardiovascular disease and emphysema	2	5
Mediastinitis	—	1
Esophageal-pleural fistula	—	1
Atelectasis	1	—

* One retroperitoneal; one gluteal.
† Death of 14 patients was considered due to metastases to the brain.
‡ One with carcinomatosis; one due to perforated diverticulum.

cavity. This potentiality has been alluded to in a study of the frequency of finding free cancer cells in pleural washings taken at the time of operation for carcinoma of the lung. Malignant cells were found in over 50% of pleural washings when the lung cancer had been biopsied and resected and in only 14% of those resected without biopsy.

To elucidate the importance of the free cancer cells, our cases were reviewed as to whether a biopsy-frozen section that was positive for carcinoma had been done prior to resection, whether a biopsy-frozen section negative for cancer before resection or whether no biopsy-frozen section had been done. There was no difference in the number of recurrences in the hemithorax of these 3 groups of patients. Thus it would appear that cancer cells spilled during biopsy are a potential but not a proved real danger as related to recurrent lung carcinoma.

Four of the patients in our series had what was considered to be palliative resections of the lung; that is, the surgeon was aware that carcinoma extended into or through the chest wall or that the tumor was extensive and infected so removal was carried out for palliative reasons. In these patients persistent carcinoma was found in the hemithorax at autopsy. The thoracic cavity from which the lobe or lung has been removed is an important site for persistent or recurrent carcinoma. However, only 2 of our patients surviving more than one month had recurrent tumor but no metastasis; 29 had metastases but no recurrence; 33 had both recurrence and metastases and 8 had neither recurrence nor metastasis.

Summary

The death and autopsy of 87 patients having had a pneumonectomy or lobectomy for carcinoma of the lung have been reviewed. Among these were 15 patients who survived less than one month. The distribution of metastasis is quite similar to that in series in which the carcinoma was untreated. There is a high rate of metastasis to mediastinal nodes. Metastasis to bone, adrenal and liver is as frequent in treated patients as in patients who are untreated. The most significant finding in our survey is the high prevalence of recurrence and persistence of disease in the hemithorax from which the carcinoma was removed. This occurred in 42.5% of the patients. This finding, along with metastasis, represents a major cause of failure of treatment of bronchogenic carcinoma.

(The references to this article may be seen in the original article.)

BRONCHOGENIC CARCINOMA IN YOUNG PEOPLE*

Richard H. Hood, Jr., LCOL, USAF, MC, Daniel C. Campbell, Jr., COL, USAF, MC, FCCP, Byron N. Dooley, Major, USAF, MC, and John A. Dooling, LCOL, USAF, MC, San Antonio, Texas.

Diseases of the Chest 48(5): 469–470, November 1965.

The purpose of this paper is to discuss 33 cases of primary bronchogenic carcinoma in patients under 40 years of age. These have been selected from the larger group of 144 cases treated by the Wilford Hall USAF Hospital since 1958. The total population from which the patients have been referred to this hospital by bases throughout the world is unknown. The frequency of carcinoma in patients under 40 years of age is much greater in our series than in other series. Although the military population and its dependents are primarily in the younger age

* From the Thoracic Surgery Service, Wilford Hall, USAF Hospital, Aerospace Medical Division (AFSC), Lackland Air Force Base.

groups, many retired individuals also compose the potential patient population.

The 33 patients ranged in age from 21 to 39 years with a mean of 34 years. They included 23 men and ten women, and this constitutes a much smaller ratio than the 8 to 1 ratio found in other series.

Pre-scalene lymph nodes were positive in 40 per cent, negative in 33 per cent, and not explained in 27 per cent. The high positive yield is unusual. All of the patients were bronchoscoped, and in 20 per cent a positive tissue diagnosis was made. The primary lesion was located on the right in 63 per cent and on the left in 37 per cent.

The cell types are shown in Table 1. The high incidence of adenocarcinoma and anaplastic carcinoma in this selective group contrasted with that

Table 1. Percentage Distribution of Patients by Sex and Cell Type

Cell Type	Total	Per Cent Men	Per Cent Women
Epidermoid	20	18	25
Adenocarcinoma	46	45	50
Undifferentiated	30	36	12
Alveolar	4	0	12

in many large series. Epidermoid carcinoma occurred as early as the age of 21 years. No correlation was found between smoking habits and type of carcinoma, since the total "pack years" could not be determined in retrospect.

Of the 33 patients, 60 per cent were considered operable and were explored, and one-half of these were resected. The remainder received either radiation or chemotherapy. Obvious metastases were found in 80 per cent of the patients at the time of surgery.

The symptoms are listed in Table 2. It should be noted that four asymptomatic patients had an average survival time of 28 months, whereas the entire group had an average of only ten months.

Table 2. Incidence of Symptoms

Symptoms	Per Cent
Cough	42
Chest Pain	39
Weight loss	8
*Headache	8
**Leg Pain	6
Pleural effusion	6
None	12

* Metastatic central nervous system lesions demonstrated.
** Disappeared when primary tumor resected.

Survival time by cell type is shown in Table 3. The only two who have survived had epidermoid carcinoma; one has survived four years since pneumonectomy without evidence of recurrence, and the other has survived three years since exploration and biopsy, followed by cobalt radiation therapy. The latter's x-ray film is normal at the present time. Among the four patients who had a lesion which was discovered as a solitary pulmonary nodule, there was no survivor.

Table 3. Average Survival Time By Cell Type

Cell Type	Months
*Epidermoid	16
Adenocarcinoma	11
Undifferentiated	6½
Alveolar	4

* 2 Survivors.

Conclusions

Apparently, primary bronchogenic carcinoma is developing with rapidly increasing frequency among the younger age groups in the population. It is hoped that symptoms and x-ray changes in young people will no longer be dismissed as benign disease and that more vigorous diagnostic study, as well as early treatment may improve our present dismal cure rate.

(The references may be seen in the original article.)

FROM THE NOTE BOOK

DRUG WARNING

Since 1957 to date, reports in the medical literature have been accumulating concerning the occurrence of Stevens-Johnson syndrome (erythema multiforme exudativum) associated with the use of long-acting sulfonamides.

This is a serious complication since it carries a mortality rate of approximately 25 per cent. To date, 116 cases of Stevens-Johnson syndrome (including 81 cases from the United States) have been reported in association with the use of long-acting sulfonamides. Almost two-thirds of the reported cases were children. In addition to the Stevens-Johnson syndrome, it is also known that serious blood dyscrasias, including aplastic anemia, agranulocytosis, pancytopenia and thrombocytopenia can occur. We are, therefore, taking this opportunity to bring to your attention the fact that the package inserts of the products listed below are being revised to contain the following prominently displayed warning:

WARNING:

Fatalities have occurred due to the development of Stevens-Johnson syndrome (erythema multiforme exudativum) following the use of (drugs listed below). Therefore, the patient must be closely observed and should a rash develop during therapy with (drugs listed below), the drug should be discontinued immediately.

Because of the long-lasting blood levels, a smaller dosage than is normally employed with shorter-acting sulfonamides should be administered. Since the short-acting sulfonamides are effective for most of the same conditions, their use should be considered before the long-acting sulfonamides are employed.

Serious reactions associated with the use of long-acting sulfonamides should be reported promptly to the manufacturer or to the Food and Drug Administration.

Lederle Laboratories Division

KYNEX® (sulfamethoxypyridazine) Tablets
KYNEX® ACETYL (n' acetyl sulfamethoxypyridazine) Pediatric Suspension
AZO KYNEX® (phenylazodiaminopyridine HCL sulfamethoxypyridazine) Tablets

Parke, Davis & Co.

MIDICEL® (sulfamethoxypyridazine) Tablets
MIDICEL® ACETYL SUSPENSION (n' acetylsulfamethoxypyridazine)

Roche Laboratories

MADRIBON® (sulfadimethoxine)
- Tablets
- Chewable Tablets
- Suspension
- Pediatric Drops

MADRICIDIN® Capsules
Each capsule contains:
- sulfadimethoxine
- phenindamine tartrate
- acetaminophen
- caffeine

AF TO TRAIN SOME DOCTORS AS TACTICAL FIGHTER PILOTS

Under a new Air Force program a small number of medical doctors will be selected each year to train as pilots in order to meet a need for dual skills in aeromedical support, teaching and research.

Four Air Force medical officers have already entered pilot training and two physicians will be selected annually for future training.

After completing the 12-month basic pilot training each pilot-physician will be qualified in a tactical fighter aircraft and will be assigned to a fighter unit for at least two years.—Commanders Digest 1(6): 4, December 25, 1965.

FROZEN WHOLE BLOOD NOW AVAILABLE IN RVN

Frozen whole blood is now available in the Republic of Vietnam, Navy's Bureau of Medicine and Surgery has announced.

First units of the frozen blood, which can be stored indefinitely, arrived at Da Nang Navy Medical Facility during Christmas week to begin a pilot program which will supplement the conventional blood bank system. Unfrozen whole blood can be stored for only 21 days.

Banks for frozen blood have been set up at Da Nang Station Hospital and aboard the hospital ship USS Repose. Two mobile medical units have been converted for use as mobile blood banks.

Enemy actions in RVN have resulted in sporadic and unpredictable numbers of casualties needing whole-blood transfusions. To meet demands, Navy set up the pilot program to test the practicality of using frozen blood under combat conditions as a supplement to the whole-blood program.—Commanders Digest 2(6): 1, January 19, 1966.

MENTAL RETARDATION CLINIC OPENS

NNMC, Bethesda, Md., Jan. 19. An outpatient children's diagnostic and study clinic, believed to be the first of its kind located on a military facility was officially opened by officials of the Medical Department of the Navy and the National Institutes of Health (NIH), Public Health Service, U.S. Department of Health, Education, and Welfare.

The facility, called the Children's Diagnostic and Study Unit, is situated on the grounds of the National Naval Medical Center in Bethesda, Md. It serves children of military personnel eligible to receive care at the U.S. Naval Hospital.

The Unit operates as a direct research activity of the National Institute of Child Health and Human Development (NICHD) of the NIH, and is run on a cooperative basis with the Pediatric Service of the U.S. Naval Hospital.

Research conducted in the Unit is clinical in nature, concentrating on the biomedical and behavioral aspects of mental retardation. As part of its function, the Unit provides complete diagnostic and evaluation studies aimed at detecting mental retardation, gives parent counseling and guidance and, where necessary, suggests facilities where further treatment or training may be obtained for the child diagnosed as mentally retarded. In addition, the Unit's staff utilizes selected educational and therapeutic procedures to help retarded children and their families, whenever such procedures may aid investigations underway at the Unit.

Researchers working in the Unit will include: child psychiatrists, neurologists, nutritionists, geneticists, nursery school teachers, speech and hearing specialists, pediatricians, public health nurses, psychologists, and social workers.

During its initial operations the Unit is geared to seeing two new children for diagnosis and evaluation each week. Many of these patients may be seen again for follow-up examinations, or to participate in staff research projects aimed at giving better treatment and training to mentally retarded children.

Later, the clinic will expand its operation to see more children each week and to begin training professional personnel to care for and treat mentally retarded children.

Organizationally, the Children's Diagnostic and Study Unit is a direct research activity of the Mental Retardation Program of the National Institute of Child Health and Human Development (NICHD).

Participating in the opening ceremony from the Navy Medical Department were: RADM Robert O. Canada MC USN, Deputy Surgeon General of the Navy; CAPT George M. Davis MC USN, Commanding Officer, U.S. Naval Hospital, Bethesda; CAPT Rufus J. Pearson, Jr. MC USN, Director of Clinical Services; CAPT Charles S. Mullin, Jr. MC USN, Chief Neuropsychiatric Service; CAPT Andrew W. Margileth MC USN, Head, Pediatric Service; and CDR Jewel P. Ray MSC USN, Administrative Officer.

Public Health Service officials included: Dr. Leo J. Gehrig, Deputy Surgeon General of the Public Health Service; Dr. G. Burroughs Mider, NIH Laboratories and Clinics Director; Dr. Donald Harting, NICHD Director; Dr. Roy Hertz, NICHD Scientific Director; Dr. Gerald D. LaVeck, NICHD Mental Retardation Program Director, and Dr. Felix de la Cruz, NICHD Children's Diagnostic and Study Unit Chief.—TIO, NNMC, Bethesda, Md.

NOVELTIES FOUND HAZARDOUS

The Public Health Service urged the public to avoid the use of small plastic water-filled cubes, balls, or units in the form of elephants which are used for cooling drinks and are made in Hong Kong.

Laboratory examination of many samples of these novelties sold in the United States in recent months have shown that the water inside the balls, which often leaks out of the plastic, is contaminated in enough cases to be a potential health hazard.

The Public Health Service is now seeking the immediate restriction of importation of these novelties and is also advising State health authorities of this action and of the data it has gathered from the laboratory examination of samples from many parts of the Nation.

The Service advised the public to look closely at packages of these novelties and at the individual cubes or balls for note of the place of manufacture. In some cases the words "Made in Hong Kong" or

"Hong Kong" are on each cube. In other cases, the words are only stamped on the container.

The Service emphasized that it has not found evidence of contamination in these or similar novelties manufactured in the United States, but studies are continuing on such devices made here and in other countries.—USDHEW, PHS, Washington, D.C., January 5, 1966.

CHLORAMPHENICOL OPTIC TOXICITY

Report from Texas: Attention has been previously directed to apparent deleterious effects of chloramphenicol (Chloromycetin) on the eye (Clin-Alert No. 63, 1962; Clin-Alert No. 188, 1965). Nine cases of blindness due to optic atrophy presumably induced by the antibiotic are on record. The present authors report a case of probable chloramphenicol-induced optic neuritis in a 9-year-old child with cystic fibrosis of the pancreas. Treatment with a total of 135 Gm chloramphenicol over an 18-week period resulted in loss of visual acuity secondary to bilateral optic neuritis. Vision gradually returned to near normal upon withdrawal of the antibiotic and the administration of high doses of vitamin B complex.—Cocke et al. (San Antonio, Texas), J Pediat 68: 27, January 1966.

Report from Pennsylvania: Visual disturbances were observed in 9 of 33 children with cystic fibrosis who received long-term (81 to 252 days) treatment with chloramphenicol. Daily doses ranged from 30 to 60 mg/Kg. The major clinical feature at onset of symptoms was marked bilateral reduction of visual acuity. Two patients had severe visual impairment and permanent residual effects with partial optic atrophy. Six children had varying degrees of blurring of optic discs, retinal hemorrhages or venous engorgement. Two other children had minimal funduscopic changes. Visual field examination revealed bilateral central scotomas in all patients tested. Vitamin B complex therapy seemed to be of some benefit in overcoming the visual disturbances. The authors believe that the chloramphenicol-induced optic reaction probably represents a neurotoxic effect of the antibiotic rather than a complication of cystic fibrosis. "Frequent test of visual acuity in children receiving chloramphenicol must be carried out by the parents and/or physician in order to detect early signs of visual impairment."—Huang et al (Philadelphia, Pa), J Pediat 68: 32, January 1966.—Clin-Alert No. 11, January 20, 1966, republished by permission of Science Editors, Inc.

DENTAL SECTION

EXPERIMENTAL CARIES INDUCED IN ANIMALS BY STREPTOCOCCI OF HUMAN ORIGIN

Zinner, D. D., Jablon, J. M., Aran, A. P. and Saslaw, M. S. Proc Soc Exper Biol and Med 118(3): 766–770, March 1965.

The long held concept that lactobacilli were the principal cause of caries was brought under question first by Orland's success in producing caries in otherwise germ-free rats by infecting them with a single strain of streptococcus. The second major advance on this subject was made by Fitzgerald and Keyes, who established the infectious nature of cariogenic strains of streptococci but found them host specific: hamster cariogens produced caries only in hamsters; and rat cariogens produced caries only in rats. This report of Zinner, et al., extends this knowledge by showing that a human cariogenic streptococcus strain was not host specific: it produced caries in hamsters.

Material from 71 human caries lesions was subcultured, and three isolates which approximated known animal cariogens, in morphologic, cultural, metabolic and immunofluorescence characteristics, were selected for further study. Of these three isolates, one strain produced rampant caries in all of 55 hamsters tested, while all control animals were caries free after 65 days. The other two isolates failed to produce animal caries. These findings support a tentative hypothesis that animal and human caries are similar to etiology, and that the infection is not host specific.

DOUBLE MATING: ITS USE TO STUDY HERITABLE FACTORS IN DENTAL CARIES

Larson, R. L. and Simms, M. E. Science 149(3687): 982–983, Aug 27, 1965.

This study indicates a strong heritable influence on the development of dental caries. Although this

factor has long been suggested by clinical experience, it had not previously been demonstrated in a clear-cut experiment wherein identical environmental conditions existed. The capability of the female rat to mate with two males of different genetic patterns during the same breeding period made it possible for mixed litters to be exposed to identical environmental conditions during uterine, preweaning and experimental periods. Osborne-Mendel rats (OM) are highly caries susceptible. NIH Black rats (BR) are low in caries susceptibility. Crossbreeds (OM x BR) are only slightly more caries active than the purebred BR.

Double mating was accomplished by caging an OM (white) female with both an OM (white) male and a BR (black) male. The resultant litters contained both purebred OM (white) and crossbred OM x BR (grey or black) pups. Weaned groups of three animals were caged together: OM only, OM and crossbreeds, and crossbreeds only. Caries was scored after 84 days on a caries test dietary regimen. The purebred OM rats developed significantly higher levels of caries activity on every basis of comparison, than did their littermate crossbreeds with which they were caged throughout the test period.

OM animals caged only with other OM developed more caries than OM caged with crossbreeds. Conversely the crossbred animals caged with their own kind only, developed less caries than crossbreeds caged with OM littermates. These results suggest that the OM rats were more capable of supporting the "caries-conducive" flora provided by the mother, than were the crossbreeds.

PRESSURES INVOLVED IN TAKING IMPRESSIONS

Douglas, W. H., Wilson, H. J. and Bates, J. F. D Pract 15: 248–250, March 1965.

When the dentist is taking impressions in the mouth of a patient, impression pastes are subjected to pressures of between 1.4 and 4.0 pounds per square inch (psi). When impressions are removed from the mouth, impression pastes are subjected to negative pressures ranging from —1.6 to —6.0 psi.

The indicated range of pressures was determined by using a capacitance transducer mounted in and flush with the tray while impressions were taken with seven zinc oxide-eugenol impression pastes in patients exemplifying the range of clinical conditions encountered in the dental office.

Tests with other types of impression materials indicate that impression pressures may be slightly lower than with the zinc oxide-eugenol pastes, but removal pressures may be higher.

Generally, insertion pressures are directly related to the fluidity of the paste. Small pressures are used with the more fluid pastes, and large pressures are used with the more viscous. Early fluidity of the paste contributes to a good impression. The more effective the seal created, the greater is the pressure required to remove the impression from the mouth.

PERSONNEL AND PROFESSIONAL NOTES

DENTAL SCIENTISTS' RESEARCH REPORT.

CAPT P. J. Boyne and CAPT D. E. Cooksey of the Naval Dental Corps are co-authors of a report entitled "Use of Cartilage and Bone Implants in Restoration of Edentulous Ridges" in JADA 71(6): 1426–1435, December 1965.

Consistent with News Letter policy, this publication will not be abstracted because every dental officer subscribes to that journal. These two Navy dental scientists reported that freeze-dried homogenous bone and cartilage implants, obtained from the tissue bank of the U.S. Naval Medical School, National Naval Medical Center, were used successfully in 27 sites in 14 human patients. Throughout four and a half years postoperative evaluation, they observed that in all cases the grafting procedure was successful; and the ridge width was increased together with greatly improved contour of the denture base area. A new subperiosteal tunnel approach used in 8 patients was described and compared to two conventional surgical techniques.

This research report involving over six years of effort was initiated when the two authors were attached to the Naval Dental School; CAPT Cooksey, as Head of the Oral Surgery Department, and CAPT Boyne as Oral Surgery Resident. The postoperative observations were accumulated principally through personal correspondence with cognizant dental officers while CAPT Boyne served as Dental Officer, at USNH, Key West, followed by a tour in

USS Bon Homme Richard, and CAPT Cooksey was Commanding Officer, U. S. Naval Dental Clinic, Yokosuka. Currently, CAPT Cooksey is District Dental Officer, COMSIX, and CAPT Boyne is Director of the Dental Department, Naval Medical Research Institute.

RECRUITMENT OF CIVIL SERVICE DENTAL HYGIENISTS. It has been reported to the Bureau of Medicine and Surgery that some activities which have established Civil Service dental hygienist positions were unsuccessful in recruiting. The reported reason was that the potential earnings of civilian practice in their particular area was much greater than the GS–4 and GS–5 levels offered by Civil Service.

Inquiry of the American Association of Dental Hygienists indicated that the problem was more one of communication than inadequate salary level. Not only is the salary range believed favorable, the additional fringe benefits, e.g. regular working hours, free weekends and job satisfaction, make such positions attractive.

Those facilities which have difficulty recruiting dental hygienists for established positions are invited to bring this to the attention of the Chief, Bureau of Medicine and Surgery (Code 611A). Through liaison with the American Association of Dental Hygienists, the Bureau of Medicine and Surgery will attempt to assist recruitment.

In some cases, dental hygienists may be recruited from another state. Because they will be employed on government property, under the supervision of a naval dental officer, it will not be necessary for them to be licensed in the state in which the naval activity is located.

ENGINEERING PROBLEMS IN DENTISTRY. The Dental Division, Bureau of Medicine and Surgery, consistently strives to resolve problems in equipment design and engineering for dental clinical and laboratory applications. There is also interest in the existence, or potential development of competence among dental officers and auxiliary personnel in microelectronic circuitry, transductance, and telemetry in measurement of oral physiological functions.

Dental Corps personnel having ideas along these lines, based on sound knowledge of the microelectronic principles involved, are invited to relate them by letter to the Chief, Bureau of Medicine and Surgery (Code 6114).

EL TORO DENTAL OFFICERS HOST DESERT DENTAL SOCIETY MEETING. Dental officers of the Marine Corps Air Station and the Thirteenth Dental Company at El Toro were hosts to the Desert Dental Society on 3 December 1965. A professional program followed a fellowship hour and a buffet dinner. CAPT H. B. McInnis DC USN, Station Dental Officer and Commanding Officer of the Thirteenth Dental Company, greeted over 70 armed forces dental officers representing 14 Army, Navy, and Air Force bases and units. CAPT W. H. Lieser DC USN presented a lecture entitled "Gnathology in Oral Reconstruction."

DENTAL OFFICER PRESENTATIONS. CAPT T. R. Hunley DC USN, U.S. Naval Dental School, National Naval Medical Center, Bethesda, Maryland, presented projected lectures and demonstrations on "Modern Operative Dentistry" before the School of Dentistry, University of Kentucky on 17-18 January 1966. CAPT Hunley also participated in a professional meeting of the Louisville Dental Society on 20 January and presented projected lectures on "Advanced Concepts of Operative Dentistry."

CAPT G. H. Rovelstad DC USN, Director, Dental Research Facility Division, Dental Department, U.S. Naval Training Center, Great Lakes, Illinois, presented a lecture entitled "Preventive Dentistry" before the New York State Dental Hygiene Teachers Association on 22 January 1966 in Rochester, New York. On 25-26 January CAPT Rovelstad presented lectures on "Preventive Dentistry" and "The Dental Patient Today" before the Rhode Island State Dental Association in Providence, Rhode Island.

LT G. T. Eden DC USN, U.S. Naval Activities, United Kingdom Detachment, Greenock, presented a paper entitled "Spherical Alloy Amalgam" before the Midwinter Scientific Meeting of the British Dental Association on 3 December 1965 in London, England.

AVIATION MEDICINE SECTION

MULTIPLE CASUALTY AIRCRAFT ACCIDENT

The following report, received from one of our west coast air stations, briefly sets down action taken and some of the problems encountered in handling a "mass-casualty" aircraft accident.

Aviation Medical facilities probably can take this opportunity to review and possibly revise their aircraft crash bill in light of experiences here stated.

1. The medical and decedent affairs aspect of subject accident is reported so that others who may be confronted with a similar situation may benefit from what we learned. Since this is primarily a Medical Department report of action, all other personnel who assisted and/or who were assisted will not be dwelt upon. However, the Orange County Sheriff's Department, the County Coroner's personnel, Marine Corps personnel at all levels, Air Force and Civilian personnel were present and did yeoman work. When statements are made that some specific action was taken, it does not necessarily follow that the action was by the Medical Department personnel.

2. An Air Force C–135A S/N 60–373 with an Air Force crew of twelve (12) and seventy-two (72) U.S. Marine Corps passengers crashed north of MCAS El Toro soon after take off about 0145, June 25. There were no survivors, making the task one of collection, identification, preparation and transportation. The area of the crash was on a ledge of Hill 1335. The utilization of motor vehicles was limited due to the type of terrain and lack of serviceable roads. Some trucks did get within a reasonable distance of the crash site, but the best method was by helicopter.

3. The Medical Department was notified at 0500 of the probability that a plane was down. A recall of all medical personnel was instituted. Until word was received from the scene that there were no survivors, plans were made to receive mass casualties. Darkness and fog delayed the locating of the crash site and placing of medical personnel on the scene. Teams of flight surgeons and hospital corpsmen were air-lifted to the scene by helicopters. The duties of these men were to assist in the locating and collecting of remains.

4. Action at the scene: A Lieutenant Colonel, USMC, was designated "on-scene commander" and he directed all action such as control of area by M.P's. maintaining communications with the Station, and general direction of scene operations. Each torso located was tagged with a number, and a stake bearing the same number was placed on the ground at that site. This numbering of stakes helped immensely in locating crew positions and in locating aircraft crew positions in the plane. Each torso, personal effects and dismembered body parts, if any at the site, were placed in a body bag and tagged with the same number as the torso and the stake. This system caused some misleading suppositions, implying that because personal effects and/or dismembered body parts were near a torso they belonged together. A better method would be to *not collect* any person effects or parts *not attached* to a torso, but for other teams to collect and chart the position where items were found. The terrain was so rough, steep and in places precipitous, that the locating and moving of remains was very time-consuming and called for much physical labor on the part of Marines and corpsmen assigned these duties. The first remains collected were released by the coroner at the scene and they were flown by helicopter to the temporary morgue at MCAS El Toro at about 1100. The first twenty-one remains arrived by helicopter and the remainder by truck. Each day thereafter for one week a detail of personnel searched the crash site for personal effects, body parts, etc. Night security was maintained to keep the curious out of the area.

4. Temporary morgue: An empty hangar (#2) was selected as a temporary morgue and all remains and miscellaneous body parts were brought to this site. An area immediately adjacent to the morgue was used for helicopter landings. When the first remains were viewed, it immediately became apparent that a great problem of identification would be encountered and that it would not be a matter of hours but perhaps days. In order to keep the remains in condition to be worked, a regular refrigerator van was provided by the Public Works Department and a most acceptable temperature range

of 34° to 38° was maintained. As the remains were received from the crash site they were placed in the refrigerator van to wait identification.

In order to obviate the back-breaking task of examining remains on hangar deck, pole litter stands were obtained and pole litters employed as temporary tables. Extra lighting was necessary and was provided by the use of two portable emergency generators. Large spot lights were suspended over the identification area.

Communication was needed immediately for both local and long distance calls. A phone was supplied but found to be inadequate in the handling of mass casualties.

Rubber gloves by the dozens were required by personnel collecting the remains and by all who assisted in moving and identifying them. It was found that a glove similar to the type used in post mortem examinations was most practicable.

Small items such as 4x4″ gauze pads, gowns, gauze masks, safety pins, G.I. cans, autopsy instruments, hand basins, swabs, disinfectants and pencils and paper were in constant demand.

5. Identification of remains: All remains were unrecognizable due to partial or complete decapitation with loss of all skull structure from the brow posteriorly. Fortunately the majority of cases had a dental arch or a partial arch for comparison purposes. One or more extremities were missing in a majority of the cases. All recovered parts were collected, and prior to releasing remains to the mortician each identified body was made complete where possible by matching the missing extremities with the identified portions. This was accomplished by matching sites of fractures, bone ends, hair, skin, and type of injury or burn. Blood typing also aided in this comparison. Missing hands and/or charred extremities made fingerprinting almost impossible. Where the pedal extremities were attached to the remains, these were in very good condition due to the protection provided by boots. This gives rise to the recommendation that all Naval and Marine personnel have a recorded footprint as part of their health records.

The Air Force Identification Specialists, Mr. Robert W. Ralston and Mr. George J. Schwaderer from Wright-Patterson AFB, Ohio, were requested and arrived on Saturday, 26 June. The Navy I.D. Specialist, Mr. Leo Trask, from the Bureau of Medicine and Surgery, arrived on Sunday with duplicate medical and dental records. The services of these men are available upon request to BuMed. All Marine records had preceded the draft on a previous flight, and until the records were returned only tentative identification could be made. Without current, up-to-date health and dental records for comparison purposes, many of the remains could not have been positively identified. The MCAS Dental Clinic provide dentists and technicians to make post-mortem dental charts and to check these charts against the current dental records. Without the aid of the specialists, the job of identification would have been much longer if not impossible. Remains were primarily identified by dental comparison, marks and scars, I.D. tags, parts of stenciled clothing and blood type. Six bodies, although tentatively identified, were further checked by fingerprint charts sent to the FBI in Washington, D.C.

6. Preparation of Remains: When the enormity of the situation became evident, the contract mortician was contacted and briefed as to the condition of the remains. It was agreed that all were not viewable and all required sealed caskets. It was also agreed that preparation of remains could only be accomplished by injection of tissue and by the use of dry chemicals. The supplying casket company went on a 24-hour schedule to meet our deadline requirements. All mortuaries within the county were called upon by our contract mortician, but he was held responsible for the work of the other companies. All remains were returned to the contract mortician where they were examined for preparation, encasement and shipping. The proper uniform was displayed in the sealed casket and a national ensign placed inside the shipping box.

A working party of Marines supervised by two hospital corpsmen and a Medical Service Corps Officer encased all remains and prepared all caskets for shipment. Without assistance, the contract mortician could not have met our shipping date requirements. Due to present requirement as to type of shipping box, it was sometimes necessary to transport remains long distances by funeral coach from the terminal airline. Only the larger jet planes will accommodate the large shipping box.

7. Shipment of Remains: The preparation of orders for escorts, procuring of plane reservations, etc., was accomplished through the Station Adjutant's office. This office also sent out all messages and received all messages from next of kin. The Decedent Affairs Officer cannot begin to handle all details in a mass casualty situation. All bodies were recovered, identified, prepared and shipped by 2 July, but only with the help of a myriad of people working as a team was it accomplished.

8. Conclusions and Recommendations:

a. Body bags will be required at approximately 110%. Availability of these bags should be part of disaster plan.

b. Field litters and field litter stands are required items.

c. A refrigerator van is a most necessary item, especially when identification will be difficult and will take a long time, or when hot weather is a factor.

d. Dental charting of all personnel should be correct and up to date.

e. Health and dental records should not accompany aircrafts.

f. The footprinting of all Naval and Marine Corps personnel as part of health records is recommended. Air Force Form 137 is a type that could be employed.

g. All personnel should be wearing I.D. tags properly upon embarking on planes.

h. Immediate installation of two or more phones in temporary morgue is necessary when mass casualties are to be handled.

i. Contract mortician should be apprised of situation and requirements as soon as possible.

j. Early assistance of I.D. Specialists should be requested when situation warrants.

k. The use of numbered stakes marking location of bodies or torsos at crash sites is recommended. —Aviation Medicine Section, BuMed.

UNAUTHORIZED POSSESSION OF SURVIVAL EQUIPMENT

A recent notice promulgated in the Washington, D. C. area cautioned personnel about the possession of illegal knives in an off-duty status. The notice referred to survival pocket knife (FSA 7340–526–8740) with hook and snap blades and warned personnel that the carrying of such a knife in the District of Columbia or across state lines, unless done so in the line of duty, was in violation of prescribed laws.

There are a number of other items of survival equipment which if carried by personnel, on leave or liberty and not in the line of duty, violate various local, State and Federal statutes. Such unauthorized possession of government property is also subject to military disciplinary action. These items include shroud cutters, survival weapons, flare guns, and pencils, smoke flares, etc. Personnel should be periodically reminded of the regulations concerning the unauthorized possession and use of government property, as well as instructed as to laws pertaining to knives and concealed weapons.

As a responsible member of the military community, interested in good discipline, and in the prevention of accidents, Flight Surgeons should avail themselves of the opportunity to educate personnel in this area as appropriate.—Aviation Medicine Section, BuMed.

DEEP FREEZE RESEARCH*

Plans were made for the Naval Aerospace Medical Research Institute to coordinate, monitor and evaluate medical research to be performed by the Navy's "Operation Deep Freeze" 1966. The first project will concern the effects of living and working at high altitudes with particular emphasis on pulmonary edema and other pulmonary problems induced by living at such altitudes in an extremely cold climate.

SPECIAL FLIGHT TRAINING*

The addition of flight training and indoctrination to the training syllabi for student aviation physiologists and student aviation experimental psychologists at the U.S. Naval Aerospace Medical Institute, was recently approved by the Chief of Naval Operations. The flight training will provide these officers with first-hand knowledge of naval aviators' problems and enable them to better meet the increasing demands of naval aviation.

FLIGHT SURGEONS ATTEND USC SAFETY COURSE

Four times a year the Aerospace Safety Division at the University of Southern California, Los Angeles, conducts a Navy Command and Staff Officers Course in Aircraft Accident Prevention. This one week of lectures is intended to familiarize Commanders and Senior Staff Officers with the course content of the 10 week Navy Safety Officers Course. It also stresses to these officers, who have ultimate responsibility for supervising aviation operations, logistic support and training, that it is through their leadership and the discharge of their responsibilities that improved operational effectiveness, mission efficiency and aviation safety performance are achieved. The course strives to:

a. Outline the components of a sound aviation safety program at all command levels.

b. Suggest Command Policies and Programs which will contribute to improved aviation safcty.

* Taken from the Medical Department Activities for November 1965—Aviation and Space Medicine.

c. Give a thumbnail sketch of the ASO Course including accident prevention, investigation, aeronautical engineering, physiology, psychology and aviation law.

d. Outline the management tools and systems analysis methodology which is used to supervise and evaluate Aviation Safety Programs.

Operational Flight Surgeons are an essential link in the total Aviation Safety Program. The continuing, energetic assumption of this responsibility by squadron and airwing Flight Surgeons has proved time and again that use of this special professional talent pays off with the saving of lives and improved operational performance. The Naval Aerospace Medical Institute has expanded its syllabus to include more information for the medical officer students which will better equip them to assist the Aviation Safety Officer and to professionally advise the Commanding Officer on all areomedical factors of the Aviation Safety effort.

The last USC course, conducted 17-21 January 1966, was attended by CDR J. H. Britton MC USN (Aerospace Medicine Resident, Pensacola) and CAPT F. H. Austin MC USN (BuMed/CNO Aviation Flight Safety). A continuing quota for one Resident per course has been established.—CAPT F. H. Austin MC USN, BuMed.

REQUIREMENTS FOR AIRCRAFT SPIN SIMULATION

The Aerospace Medical Research Department of the U.S. Naval Air Development Center, Johnsville, Pennsylvania is conducting an investigation to determine the feasibility and requirements for aircraft spin simulation. The purpose is to ascertain through analysis and experiments the practicability of simulating aircraft spinning type maneuvers and evaluate the effectiveness of fixed base simulation as compared with dynamic force field simulation.

In the past, the Johnsville human centrifuge has demonstrated that it is a most effective means of providing realistic force environments associated with aerodynamics situations and is considered an excellent device for this study.

There is a recognized need for a training device to provide aviators with experience in spin recovery and spin avoidance techniques in certain types of advanced aircraft. Such a training device should simulate a number of characteristics of the actual spin situation. It is generally agreed that these characteristics should include instruments and controls that dynamically reproduce those conditions found in the actual spin. A device incorporating the foregoing characteristics is frequently described as a fixed base simulator. In the judgment of some qualified personnel, a fixed base simulator does not include one of the most important characteristics of the actual spin environment, namely, the force environment to which the aircraft and pilot are exposed during the spin. This force environment imposes physiological and psychological stresses on the pilot which conceivably contribute significantly to the difficulties of the piloting task. In this respect, the fixed base simulator is considered to be inadequate as a spin trainer. A training device which would incorporate the characteristics of a fixed base simulator as well as the force environment with its concomitant physiological and psychological stresses, will be called a dynamic force field simulator.

The spin simulation program will include an F–4 aircraft cockpit mockup installed in the gondola of the Johnsville human centrifuge.—Aviation Medicine Section, BuMed.

INVESTIGATION TO DETERMINE THE POTENTIAL HAZARDS OF RESPIRATORY INFECTION IN AN ATMOSPHERE CONSISTING OF 100% OXYGEN AT 5 PSIA (27,000 FT.)

The Aerospace Crew Equipment Laboratory is undertaking an investigation to ascertain whether respiratory infections occurring in a pure oxygen atmosphere increases the incidence of atelectasis and if so whether it can be reversed by remedial actions. The laboratory effort is at the request of the National Aeronautics and Space Administration. This program is an extension and amplification of the work previously conducted to assist NASA in atmosphere selection for spacecraft. Emphasis is to be placed on establishing if physiologic effects produced by upper and lower respiratory infections are enhanced by pure oxygen atmospheres and if any demonstrated effect can be reversed by predetermined techniques.

The laboratory will have a working agreement with a local hospital to permit studies on volunteer subjects having respiratory infections.

Subjects for this study will be limited to males who demonstrate an infection, upper or lower, respiratory in nature. Both types will be investigated. A control group of subjects will also be monitored in an attempt to differentiate between the pattern produced by the normal progress of the infection and that occasioned by the use of 100% oxygen environment (currently used in spacecraft and some military aircraft).

Phase I of the investigation will be conducted at sea level in an atmosphere of 100% 0_2 at the participating hospital. Phase II will be prosecuted in the Altitude Facility at the Navy Aerospace Crew Equipment Laboratory at which the oxygen exposure will be at a simulated altitude of 27,000 feet.

Provision will be made for the obtainment of clinical and physiological measurements as well as for the transfer of medications, water, etc.

Clinical and physiological measurements will include but not be limited to:

Arterial blood gas analysis
Alveolar—Arterial oxygen gradients
Pulmonary Function Tests
Chest and sinus X-rays
Complete ENT studies

If and when, during the course of any of the subject exposures atelectasis is evidenced, predetermined efforts will be made to reverse the condition. —Aviation Medicine Section, BuMed.

MATERIAL FOR BASE UTILIZATION STUDY GROUP

The U.S. Naval Aviation Medical Center, located aboard the Pensacola, Florida Naval Air Station, contributes a major portion of the Navy's medical program of adapting men to flight.

It was established on 8 April 1957 by authority of the Secretary of the Navy and commissioned on 30 April 1957 by RADM B. W. Hogan MC USN, then Surgeon General of the Navy.

Occupying a little over 39 acres of land, the Center is comprised of the U.S. Naval Hospital, U.S. Naval Aerospace Medical Institute, and U.S. Naval Aviation Medical Center Staff Unit.

Through joint utilization of the professional staff of the U.S. Naval Hospital and the U.S. Naval Aerospace Medical Institute, consultation and diagnostic services are available to all military activities in the Gulf Coast area—from Panama City, Florida, to New Orleans, Louisiana, and north to Atlanta, Georgia.

A clinical aspect of the Center is the special board of flight surgeons, composed of top medical specialists who convene each week to evaluate all "problem cases" arising throughout Naval and Marine Corps aviation.

The U.S. Naval Aerospace Medical Institute, under the command of CAPT Henry C. Hunley, Jr. MC USN, has a dual mission—that of training aviation medical department personnel and conducting aerospace medical research.

Officer training programs include: a six-month training program for medical officers leading to designation as naval flight surgeons; two-year residency program in aerospace medicine leading to board certification in Preventive Medicine (Aerospace Medicine); a six-month training program for experimental psychologists; a four-month training program for aviation physiologists; and refresher courses for naval flight surgeons.

The U.S. Naval Aerospace Medical Institute supports the Naval Air Training Command in the psychological testing and selection of personnel.

Physiological indoctrination and instruction of non-medical aviation personnel in high altitude, night vision, emergency escape procedures and other related fields are also provided.

Examining facilities and highly qualified senior naval flight surgeons are available at the Institute to determine the physical fitness of personnel for admission to and retention in the Naval Aviation Training Program.

Research in aviation medicine preceded the official establishment of the U.S. Naval Aerospace Medical Institute.

Although the major research activities of the Institute are still in the field of aviation medicine, the research staff has reoriented much of their program in order to undertake investigations relevant to bioastronautics.

These studies include cosmic radiation, exotic environments, bizarre accelerations, animal and human space flight, selection of astronauts and medical aspects of recovery of astronauts.

As early as the summer of 1940, a group of scientists, sponsored by the Bureau of Medicine and Surgery and the National Research Council, conducted clinical studies and various physiological and psychological tests on 1,056 student aviators and flight instructors. This longitudinal study of normal individuals has been followed at intervals ever since and is referred to as the "1,000 Aviator Program."

The U.S. Naval Aerospace Medical Institute moved into its new facilities in May 1965.

These newly constructed facilities consist of two windowless, air-conditioned buildings with a combined total area of 90,000 square feet.

The main building is a two-story structure, with an animal penthouse, providing spaces for administration and research.

The second building provides classroom facilities for the training of student flight surgeons and modern facilities for the aviation physical examination division.

The recently dedicated Vestibular Laboratory houses not only the Slow Rotation Room and a Human Disorientation Device, but a newly constructed Coriolis Acceleration Platform.

This and the Vestibular Laboratory annex, which will house a horizontal linear oscillator, an animal centrifuge, and a visual display screen, will continue to be one of the Command's major research facilities.

A limited number of medical officers each year are afforded the opportunity for specialized training in aviation medicine.

Medical officers selected for such training are sent to the U.S. Naval Aerospace Medical Institute at the Naval Aviation Medical Center, Pensacola, Florida, for a course of instruction lasting about six months, and, upon successful completion of the course, they are designated naval flight surgeons.

The curriculum is divided into two parts. The first, approximately four months, is a good general review of all medical subjects, with emphasis placed on a few subjects which are more important in aviation medicine, i.e., ophthalmology, otolaryngology, psychiatry, cardiology, and physiology—both respiratory and cardiovascular. The second phase, approximately six weeks, is devoted to flight training. This training should qualify one to solo aircraft, although flight surgeons and student flight surgeons will not be required to do so. Medical officers designated as flight surgeons and ordered to duty involving flying are entitled to additional pay while so serving.

Duty assignments of flight surgeons are to naval air stations, to various type squadrons—both Navy and Marine—to aircraft carriers, etc. Station hospitals on major naval air stations provide professional opportunities in all respects similar to those in smaller naval hospitals. In addition, there is opportunity for considerable research in aviation medicine, dealing with such problems as selection and training of pilots, disorientation, "g" forces, oxygen supply, protective equipment, escape from high speed, high flying aircraft, etc.

All medical officers, whether regular or reserve, are required to sign a "service agreement" before being ordered to any duty under instruction.

The U.S. Naval Aerospace Medical Institute devotes approximately twenty-five percent of its effort in training naval flight surgeons and ancillary personnel. The major workload of the Institute is support of the Training Command in the indoctrination and training of student naval aviators and other personnel, conduct of basic and applied research in the field of aerospace medicine, test and evaluation of aviation and aeromedical equipment, and provision of clinical care. The congregation of talented personnel to perform the support mission of the Training Command results in a fallout bonus in that they are available for teaching for a minor portion of their time. Only two flight surgeons, the Director and Assistant Director of Training, devote the major portion of their time to the supervision of students. The others would still be required even if no flight surgeon students were trained.

Number of medical corps officers trained during the past three years (by year):

FY 1965: 129
FY 1964: 122
FY 1963: 120

The number of graduates has always been below our operational requirements.

It is recommended that the training of flight surgeons be continued as is.

(By CAPT J. W. Weaver MC USN, Aviation Medicine Section, BuMed.)

EDITORIAL DESK

NEWLY QUALIFIED SUBMARINE MEDICAL OFFICERS

The Commanding Officer, U.S. Naval Submarine Medical Center, takes great pleasure in announcing that the below listed medical officers have recently qualified and have been designated as Qualified Submarine Medical Officers under the new qualification procedure established by the Bureau of Naval Personnel. Under this new procedure, the Commanding Officer, U.S. Naval Submarine Medical Center, U.S. Naval Submarine Base New London, Groton, Connecticut, has been delegated sole authority for qualification of Submarine Medical Officers.

To achieve designation as Qualified Submarine Medical Officer, the medical officer must be a graduate of the School of Submarine Medicine; serve a minimum of three months probation in a submarine or diving billet; publish a thesis on some phase of this military specialty; complete a compre-

hensive written examination; and be recommended by his Commanding Officer.

Submariners "Dolphins", the hard earned insignia of the Navy's underwater fleet, were awarded to the following physicians:

LCDR W. F. Miner MC USN
LCDR H. A. Engelke MC USN
LT W. L. Dennison MC USN
LT J. H. Earls MC USN
LT R. W. Sawyer MC USN
LT D. C. Silcox MC USNR
LT R. W. Moore MC USN
LT T. Hill MC USNR
LT P. H. Farrier MC USNR
LT R. Crafts MC USNR
LT D. R. Gillingham MC USN
LT R. G. Robinson MC USNR
LT P. J. Costello MC USNR
LT R. W. Moynan MC USN
LT W. E. Winn MC USN
LT G. S. Petrone MC USN

NAVAL RESERVE MEDICAL COMPANY 5–6

The Naval Reserve Medical Company 5–6, Washington, D.C., placed first for the non-pay programs not competing in national competition in the Fifth Naval District for the fiscal year 1965.

RADM Joseph Yon MC USN, District Medical Officer of the Fifth Naval District, presented the awards to the Company at their regular drill on 19 October 1965.

The certificate of the award was presented to CDR Jack W. Bongberg MSC USNR, who was the Commanding Officer of the Unit during the period of the competition.

The commendation reads in part:

"This is a noteworthy achievement which attests to your conscientious leadership and clearly indicates the results of superior performance in the fields of training and administration. This effort resulted in Naval Reserve Medical Company 5–6 acquiring a high degree of mobilization readiness and has contributed materially to the strengthening of the Naval Reserve Program."

The Commandant's cup and permanent plaque were presented to CDR Otho D. Easterday MSC USNR, the present CO of the Unit.

Among the visitors for the presentation were RADM Raymond T. Holden MC USNR, the first CO of the Company, CAPT McWilliams MC USN, Omaha, Nebraska, CAPT Curtiss Cummings MC USNR, Representative for Reserves at Bureau of Medicine and Surgery, Washington, D.C., CAPT Dickens MC USN, Senior Medical Officer, Washington Area Command, CAPT J. F. Buckner MSC USN, Program Officer for the Fifth Naval District. —CO, NavResMedCo 5-6.

GROUND-BREAKING CEREMONIES AT OAKLAND NAVAL HOSPITAL

Ground was broken on December 7, 1965 for the new Oakland Naval Hospital, to replace the "temporary" hospital that has served the fleet for more than 23 years. This date was chosen to commemorate the enemy attack on Pearl Harbor December 7, 1941.

RADM Harold J. Cokely, Commanding Officer, welcomed more than 300 guests aboard for the ceremony.

The first spadeful of earth was turned by a Marine patient, Staff Sergeant Raymond I. Thibodeaux of New Orleans, La., who has twice earned the Purple Heart for war wounds—the first in Korea and the second in Viet Nam.

Commenting on the significance of the hospital to the nation, the community, and the armed services were Congressman George P. Miller of Alameda, Oakland Mayor John P. Houlihan, and RADM Cecil D. Riggs, MC USN, who came from Washington, D.C., to represent the Navy Department's Bureau of Medicine and Surgery.

CAPT John D. Burky, Civil Engineer Corps, Director of the Western Division of the Navy's Bureau of Yards and Docks, spoke about the new construction, for which he is the officer in charge.

The new nine-story, 650-bed hospital will have a four-story base. The five upper floors or tower will reach out in the shape of a cross. They will contain the nursing wings, where all rooms will look out to the surrounding hills.

The hospital is to be built at a cost of approximately $14,500,000.

Architects for the new building are Stone, Maraccini, and Patterson and Associates and Milton T. Pflueger of San Francisco.

Contract for construction of the new building has been awarded to Huber, Hunt, and Nichols of Santa Clara.

Staff Sergeant Raymond I. Thibodeaux of New Orleans, La., who has twice earned the Purple Heart for war wounds, turns the first spadeful of earth at ground-breaking ceremonies at Oakland Naval Hospital. Looking on, from left, RADM Cecil D. Riggs from the Navy's Bureau of Medicine and Surgery in Washington, D.C.; Congressman George P. Miller of Alameda, and RADM Harold J. Cokely, Commanding Officer of the hospital.—Public Information Office, U.S. Naval Hospital, Oakland, California.

SUBMARINE MEDICINE INDOCTRINATION COURSE

Convening dates for Submarine Medicine Indoctrination Course for Reserve Officers:

7 February to 18 February 1966
20 June to 1 July 1966
3 October to 14 October 1966

In the past, reserve medical officers have been ordered to on-the-job training in submarine medicine at U.S. Naval Submarine Base New London, Groton, Connecticut. These officers were usually ordered on an individual basis. It will be beneficial to these officers to attend our formal course.

It is requested that officers ordered to attend subject course be directed to report prior to 2400 on the day preceding above noted convening dates.—Submarine Medicine Branch, BuMed.

FEDERAL FUND-RAISING CAMPAIGN AT CAMP PENDLETON, CALIFORNIA

CAPT Herbert A. Markowitz, Commanding Officer and CDR Robert M. Ware, Administrative Officer and Campaign Chairman for the 1966 Combined Federal Campaign Drive, show MGEN Robert E. Cushman, Jr., Camp Pendleton Base Commander the plaque presented to the hospital at recent ceremonies in San Diego for achieving the highest percentage of "Fair Share" contributions in the Camp Pendleton area. The Combined Federal Fund-raising Campaign was for the benefit of the United Community Services Fund, National Health Agencies, and the International Service Agencies.—U.S. Naval Hospital, Camp Pendleton, Calif.

AWARDS CEREMONY

LT Thomas E. Fell MC USNR was presented the Navy Commendation Medal with Combat Distinguishing Device by CAPT John E. Gorman MC USN, Commanding Officer, U.S. Naval Hospital, Bremerton, Wash., at a special awards ceremony held at the hospital on 7 January 1966. Dr. Fell earned the award for services in Viet Nam as set forth in the following citation:

"For meritorious achievement while serving as Medical Officer with the First Battalion, Ninth Marines in the Republic of Viet Nam. Throughout the period from 1 April until 6 September 1965, LT Fell distinguished himself by his professional skill and untiring energy in tending to the sick and wounded Marines of the Battalion. Often disregarding his personal comfort and safety, he exposed himself to hostile fire as he boldly accompanied infantry units on many combat operations, thereby making his vital services more readily accessible when needed, and also ensuring that the hospital corpsmen were properly supervised. An equally important aspect of his duties involved directing the medical portion of his Battalion's civil affairs program. LT Fell and his medical team worked many long hours treating thousands of Vietnamese villagers in or around the Da Nang area. Often he courageously traveled to villages that were under insurgent communist (Viet Cong) influence, jeopardizing his own life in order to help the people. His efforts provided a significant contribution to the attainment of a working rapport between the Marines and the neighboring villagers. By his dedication to his profession and his inspiring example to his men, LT Fell upheld the finest traditions of the United States Naval Service."

Dr. Fell, a staff medical officer at the Bremerton Naval Hospital since September, 1965, will be returning to Viet Nam in February, at his own request, for another tour of duty with the Marines. He is a native of Chicago, a graduate of Beloit College, and a graduate of the University of Chicago Medical School. His parents, Dr. and Mrs. Egbert H. Fell, are currenty serving at the American Mission Hospital in Kuwait.—CO, U.S. Naval Hospital, Bremerton, Washington.

ASSOCIATION OF MILITARY SURGEONS

The Association of Military Surgeons of the U.S. is endeavoring to give an additional service to its members and to the Federal Medical Services. The journal, "Military Medicine" published by that association will include in future issues, lists of medical opportunities in all of the professional disciplines that make up the memberships.—Editor.

ACKNOWLEDGMENT

Additional information received indicates that Ward O. Griffen, Jr., MD is a LCDR MC USNR-R and is a member of the U.S. Naval Reserve Medical Company 5–1 at Lexington, Kentucky. His article entitled "Non-Penetrating Abdominal Trauma" can be found in Volume 47, Number 1, Page 1 of U.S. Navy Medical News Letter.—Editor.

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